

Amendments to the Specification

The paragraph starting at page 3, line 24 and ending at page 4, line 5 has been amended as follows.

Fig. 7 is a circuit diagram illustrating an example of the structure of the conventional DC/DC converter and its voltage control circuit. The input voltage V_{in} of the DC/DC converter supplied from a power supply unit (not shown) is applied to a switching element 201. A DC output obtained by a conversion in the switching element 201 and diode 209 is delivered via ~~a inductance 202~~ an inductance 202 and is supplied as an output voltage $VH-b$ to a printhead serving as a load.

The paragraph starting at page 10, line 21 and ending at page 11, line 14 has been amended as follows.

According to ~~on~~ one aspect of the present invention, the foregoing object is attained by providing a printing apparatus for performing printing using a printhead having a plurality of printing elements, comprising: means for inputting print data; converting means for converting print data to drive data corresponding to the printing elements; transfer means for transferring the drive data to the printhead in a serial format in unit of N bits at a time; driving means for driving the printing elements based upon the drive data;

counting means for counting M-bits of data transferred first among the drive data in synchronism with transfer of the drive data by the transfer means, where $N > M$; detecting means for detecting an increase in the value of a count obtained by the counting means; and voltage generating means for outputting a voltage that drives the printing elements; wherein if the detecting means has detected an increase in the value of the count, the voltage generating means raises the output voltage before the driving means performs drive based upon drive data transferred next.

The paragraph starting at page 15, line 20 and ending at line 27 has been amended as follows.

In this specification, “print” is means not only to form significant information such as characters and graphics, but also to form, e.g., images, figures, and patterns, on printing media in a broad sense, regardless of whether the information formed is significant or insignificant or whether the information formed is visualized so that a human can visually perceive it, or to process printing media.

The paragraph starting at page 16, line 17 and ending at page 17, line 7 has been amended as follows.

As shown in Fig. 8, four ink-jet printheads for printing respective ones of colors, namely a Bk (black) head 2-1, a Y (yellow) head 2-2, an M (magenta) head 2-3 and a C (cyan) head 2-4, ink tanks 1-1 to 1-4 attached integrally to the printheads and an optical home position sensor (referred to as an "HP sensor" below) 8 are mounted on a carriage 3. The carriage 3 is coupled to part of a drive belt 4 that transmits the driving power of a carriage drive motor 5 and is movably mounted on a guide ~~shaft 6~~ shafts 6A and 6B disposed in parallel with the scanning direction. The arrangement is such that the carriage 3 is moved back and forth by the driving force of the carriage drive motor 5 relative to a platen [[7]], which is disposed so as to face the ink discharge surface of the ink-jet printheads 2-1 to 2-4, to thereby print across the full width of printing paper transported by a printing-medium transport mechanism (not shown).

The paragraph starting at page 19, line 8 and ending at line 11 has been amended as follows.

When the carriage 3 is moved and the mounted printheads 2-1 to 2-4 arrive at ~~location~~ locations where the ink is to be discharged, the head control block 37 exercises control so as to discharge ink.

The paragraph starting at page 20, line 18 and ending at page 21, line 2 has been amended as follows.

A load-quantity transition sensing circuit 38 senses the number of pixels conforming to the driven number of nozzles of the printhead from a serial data signal 37-13, which is part of the control signal sent to the head carriage 3 from the gate array 36 that includes the head control block 37, detects the state of transition of a certain specific number of pixels and transmits a control signal to a control-voltage correcting circuit 39 via the flexible cable 13, thereby varying and controlling head drive voltages VH-b and ~~VH-x~~ VH-c, which are output voltages of the DC/DC converter 40.

The paragraph starting at page 22, line 1 and ending at line 10 has been amended as follows.

N-bits of serial data signal 37-13 ~~is~~ are stored sequentially in a shift register 2-101, which has been constructed on the Bk head 2-1, in synchronism with the clock signal 37-15 and is used for the purpose of selecting which of the nozzles is to discharge ink. When transmission of data for this number of nozzles ends, the latch signal 37-14 is transmitted and the data that has been stored in the shift register 2-101 is shifted to a register 2-102, whereby the setting of the data ends.

The paragraph starting at page 25, line 17 and ending at page 26, line 3 has been amended as follows.

The intermediate-load detecting circuit 303 outputs a detection signal 303-1 in a case where the number of nozzles driven simultaneously included in the data of the higher-order N-a bits of the serial data signal 37-13 from the signal of the BK data counter 37-4 is outside a range detected by the light-load detecting circuit 301 and the heavy-load detecting circuit 302. If the intermediate-load detecting circuit 303 outputs the detection signal, a reset signal is output to reset terminals of the counter circuit 304, which is connected to the light-load detecting circuit 301, and of the latch circuit 305, whereby the counter circuit 304 and the latch circuit 305 are reset.

The paragraph starting at page 27, line 7 and ending at line 20 has been amended as follows.

If there is a transition from the light-load state to the heavy-load state, the timing of the higher-order (N-a)th bit of the N-bit serial data signal 37-13 is detected and a high-level signal it is output from the latch circuit 314, all three inputs to the AND gate 306 assume the high level and a high-level signal is output from the AND gate 306. The high-level signal output from the AND gate 306 passes through a latch circuit 307 and

enters the control-voltage correcting circuit 39 of the DC/DC converter 40 at a timing that is earlier, by the time needed to send a-number of bits, than that at which the serial data signal 37-13 is actually set in the shift register 2-101.

The paragraph starting at page 36, line 8 and ending at line 12 has been amended as follows.

~~Example~~ Examples of storage media that can be used for supplying the program are a floppy disk, a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a CD-RW, a magnetic tape, a non-volatile type memory card, a ROM, and a DVD (DVD-ROM and a DVD-R).